

REMARKS**Summary of the Office Action**

Claims 1, 2, 6-10 and 16-18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,142,393 to Okumura et al. (hereinafter “Okumura”) in further view of U.S. Patent No. 6,320,629 to Hatano et al. (hereinafter “Hatano”) and U.S. Patent No. 6,351,298 to Mitsui et al. (hereinafter “Mitsui”).

Claims 3, 4, 11 and 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okumura in further view of Hatano, Mitsui, U.S. Patent No. 6,204,905 to Koma et al. (hereinafter “Koma”) and “Materials Chemistry and Physics” to Wu.

Claims 5 and 13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okumura in further view of Hatano, Mitsui, Koma, Wu and U.S. Patent No. 5,850,274 to Shin et al. (hereinafter “Shin”).

Claims 5 and 13-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okumura in further view of Hatano, Mitsui, Koma, Wu and U.S. Patent No. 5,909,265 to Kim et al. (hereinafter “Kim”).

Summary of the Response to the Office Action

Applicant has amended claims 1-2 and 9-10 to differently describe the invention and to improve the form of the claims. Applicant has also amended the Abstract to conform to the claim amendments. Accordingly, claims 1-18 remain pending for consideration.

Rejections under 35 U.S.C. § 103(a)

Claims 1, 2, 6-10 and 16-18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okumura in further view of Hatano and Mitsui. Claims 3, 4, 11 and 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okumura in further view of Hatano, Mitsui, Koma and Wu. Claims 5 and 13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okumura in further view of Hatano, Mitsui, Koma, Wu and Shin. Claims 5 and 13-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okumura in further view of Hatano, Mitsui, Koma, Wu and Kim. To the extent that these rejections might still apply to the claims as newly-amended, they are respectfully traversed as follows.

Independent claims 1 and 9 have been amended to recite a liquid crystal display combination and a method for fabricating a liquid crystal display, respectively, in which a liquid crystal layer, provided between first and second substrates, has a twist angle in a range of 1 to 89 degrees. These claims also recite that an optical plate is provided between the liquid crystal layer and the second substrate.

As described at least at page 2 of the Background of the Invention portion of the instant application, a twisted-nematic (TN) liquid crystal having a twist angle of 90 degrees is mainly used as a liquid crystal for LCDs. The Office Action also concedes that this is the case at page 2, stating that liquid crystal layers are typically “twisted nematic or super-twisted nematic, both of which had a twist angle of at least 90 degrees.”

On the other hand, the instant application is directed to an arrangement which utilizes a low twisted-nematic (LTN) liquid crystal having a twist angle in a range of 1 to 89 degrees. As described, for example, at page 8 of the instant specification, since the liquid crystal of the arrangement and methodology of the instant application has such a small twist angle, it can

compensate a light incident to or coming out from the TN liquid crystal display by using, for example, only an optical plate (for example, A-plate 32) without using the C-plates and the O-plates of the hybrid structures described in the Background of the Invention portion of the instant application in connection with Fig. 1. As described further at page 12 of the instant application, this advantageous feature of the instant application's invention results in an improved viewing angle and contrast while simultaneously simplifying the panel structure and reducing the number of manufacturing steps.

Applicants respectfully submit that the applied art of record does not teach or suggest a liquid crystal display or manufacturing methodology including these particular features in combination, as recited in independent claims 1 and 9, as newly-amended.

Accordingly, Applicant respectfully asserts that the rejections under 35 U.S.C. § 103(a) should be withdrawn because neither of Okumura, Hatano, Mitsui, Koma, Wu, Shin and Kim, whether taken singly or combined, teach or suggest each feature of independent claims 1 and 9, as amended. MPEP § 2143.03 instructs that "[t]o establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 409 F.2d 981, 180 USPQ 580 (CCPA 1974)." Furthermore, Applicant respectfully asserts that dependent claims 2-8 and 10-18 are allowable at least because of their dependence from claims 1 and 9 and the reasons set forth above.

Furthermore, Applicant respectfully submits that the Office Action has pieced together up to six out of seven references to teach the claimed features. However, MPEP § 2143.01 instructs that "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. In re Mills, 916 F.2d 680, 16 USPQ 2d 1430 (Fed. Cir. 1990)." MPEP § 2143.01 further instructs

that "[a]lthough a prior art device 'may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so.'" Applicant respectfully submits that the references do not provide such a suggestion or motivation. Applicant respectfully submits that the only motivation to piece together the six out of seven references of the Office Action is found in the Applicant's own application. MPEP § 2141 instructs that "the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention." MPEP § 2143 instructs that "the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ 1438 (Fed. Cir. 1991)." The Federal Circuit has clearly held that "the motivation to combine references cannot come from the invention itself." Heidelberger Druckmaschinen AG v. Hantscho Commercial Products, Inc., 21 F.3d 1068, 30 USPQ 2d 1377 (Fed. Cir. 1993). Thus, Applicant respectfully submits that the Office Action has not established a *prima facie* case of obviousness and that the rejections under 35 U.S.C. § 103(a) should be withdrawn.

Attached hereto is a marked-up version of the changes made by the current amendment. The attachment is captioned "Version with Markings to Show Changes Made."

CONCLUSION

In view of the foregoing, Applicant respectfully requests reconsideration and the timely allowance of the pending claims. Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicant's undersigned representative to expedite prosecution.

EXCEPT for issue fees payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§ 1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account 50-0310. This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. § 1.136(a)(3).

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADEIN THE ABSTRACT:

Please amend the Abstract at page 18 to read as follows:

A multi-domain liquid crystal display and method of fabricating the same is disclosed in the present invention. More specifically, a liquid crystal display includes first and second substrates, a liquid crystal layer between the first and second substrates, wherein the liquid crystal layer has a twist angle in a range of 1 to 89 degrees [~~of at least 90 degrees~~], and an optical plate between the liquid crystal layer and the second substrate, wherein the optical plate has an optical axis horizontal to the first and second substrates.

IN THE CLAIMS:

Claims 1-2 and 9-10 have been amended as follows:

1. (Amended) A liquid crystal display, comprising:
first and second substrates;
a liquid crystal layer between the first and second substrates, wherein the liquid crystal layer has a twist angle [~~of at least 90~~] in a range of 1 to 89 degrees; and
an optical plate between the liquid crystal layer and the second substrate, wherein the optical plate has an optical axis horizontal to the first and second substrates.

2. (Amended) The device of claim 1, further comprising:
a pixel electrode on the first substrate;
a first alignment layer on the pixel electrode;
a common electrode on the [second substrate] optical plate; and
a second alignment layer on the common electrode.

9. (Amended) A method of fabricating a liquid crystal display having first and second substrates, the method comprising:

forming a liquid crystal layer between the first and second substrates, wherein the liquid crystal layer has a twist angle ~~[of at least 90]~~ in a range of 1 to 89 degrees; and

forming an optical plate between the liquid crystal layer and the second substrate, wherein the optical plate has an optical axis horizontal to the first and second substrates.

10. (Amended) The method of claim 9, further comprising the steps of:

forming a pixel electrode on the first substrate;

forming a first alignment layer on the pixel electrode;

forming a common electrode on the ~~[second substrate]~~ optical plate; and

forming a second alignment layer on the common electrode.